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STUDY OF MAN.

ANYONE would suppose that the study of man, especially during childhood and youth, would be the most practical and necessary of all lines of inquiry. But, as a matter of fact, it is the most neglected of all studies. There are sciences of geology, botany, and zoölogy, but a science of living man as he is today does not exist. It is comparatively easy to arouse interest in expeditions to the north pole or into darkest Africa; to engender enthusiasm in investigation of sun, moon, and stars; but it is very difficult to direct attention to the study of modern civilized man. Millions are given yearly for the study of rocks, plants, and animals, but almost nothing for the study of children. What could be more practical than investigations of human beings from childhood through youth to manhood? While facts in nature are very interesting and, no doubt, of importance, they cannot have the direct practical value which facts about man himself possess.

Why is it that there is so little definite knowledge about modern man? It is mainly because he has been studied so little. The first case in the history of this world of a thorough scientific study of a human being is that made on Zola[†] in 1897 by a number of French specialists. Such a statement as this may seem hazardous, but it is literally true.

METHODS OF INVESTIGATION.

Man has been studied in a statistical way as to his acts and thoughts in the past; but this method is necessarily inexact and uncertain, because the events are so far removed in time. It is not only difficult to understand the past in which we did not live, but also to distinguish between facts, inferences, and opinions as recorded by writers, who often had some special point of view and omitted important data. For this reason alone a science of history may be impossible.

[†] Results are given in article on Zola (by writer), reprint, 1901.

It is only in investigations of man as he is *now* that facts can be dealt with at first hand.

MORE EXACT STUDY OF MIND NEEDED.

Rigid methods of research have until lately been confined to physics, astronomy, physiology, and other sciences; and when applied to man they have been concerned rather with his physical than mental side. It is only recently that more exact methods have been used in the study of man's mind. These methods were opposed and ridiculed by extreme doctrinaires, but such opposition has ceased almost entirely, and where it does exist it is due either to ignorance or to mistakes liable to occur in the introduction of new methods.

If the study of man is to be worthy of the name, rigid methods must be applied to his mind as well as to his body. The most satisfactory and best method yet known is the psycho-physical method, introduced by Fechner and developed by Wundt into what is called "physiological psychology."

PSYCHO-PHYSICAL LABORATORY.

The first requisite to carry out this psycho-physical method of study is a laboratory containing instruments of precision.

In the study of man one of the greatest difficulties is the defectiveness and limitations of his senses. These defects have reference, not only to insufficiency of the senses to discover certain truths, but also to the errors they cause us to make.

The diurnal rotation of the earth, the distance of the stars, and the weight of the air are not appreciated by our senses, and often may seem contradictory to them. The sensations of cold and heat are not absolute, but merely relative to the temperature of our bodies, frequently misleading us. The illusions of sight, hearing, and touch point to the conclusion, accepted by modern psychology, that our ideas of the external world are the result of a long and unconscious education of the senses.

Science has destroyed the prejudice of the infallibility of the senses, and now finds its main help in the study of man to be in the use of instruments of precision. These not only correct the defects of the senses, but increase their scope, so that the results

of investigation may be described more fully and determined more definitely.

LABORATORIES IN UNIVERSITIES.

While the initiative in psycho-physics came from Europe, it is in our country that it has developed to the greatest extent. A large number of laboratories have been established, most of which are in the universities. But the plan of these laboratories is mainly for pedagogical purposes. The research work is generally done by students desiring to prepare theses for their doctorates. While many of these theses are very valuable, a university could hardly extend such work to large numbers of individuals, for to gather the facts, compute and tabulate the results, would involve clerical duties and other work not undertaken by universities. The psycho-physical work in the university is generally confined to small numbers of persons, who are a special class, so that it is doubtful whether conclusions obtained can always be applied to people in general.

The main object of a university is to *prepare* men for work, not to carry on their work.

NEED OF A LABORATORY FOR SOCIOLOGICAL PURPOSES.

There is need, then, for a psycho-physical laboratory different from those in our universities; that is, one not pedagogical, but sociological and practical, and of more utility to society directly.

The purpose of such a laboratory is to collect sociological, pathological, and abnormal data as found especially in *children*, and in the *criminal* pauper and defective classes, and in hospitals; to gather more special data with instruments of precision, and also to collect and publish the results of similar work in this country and Europe.

But it may be said that the time is not ripe for psycho-physical work on a large scale. This may be true of much of the finer experimental work carried on in our universities, some of which is an experiment with experiments. But the purpose of this laboratory is to apply to large numbers of individuals only such experiments as are well attested. For if there is ever

to be sufficient definite knowledge of living civilized man, to become a *science*, it can only be gained by the study of large numbers of persons.

Conclusions depending on small numbers are useful and instructive, but if they are to carry weight, they must be based upon numerous individuals of all classes.

But the psycho-physical study is not all the work. Of no less importance are the sociological investigations involved, including the gathering of anthropological and medical data. In new work the field is always too large, and therefore it would be imperative at first to study in those parts only which will bring results most useful to society.

INVESTIGATION OF CRIMINAL AND DEFECTIVE CLASSES.

A special and very practical feature of a psycho-physical laboratory would be the study of the criminal and defective classes. As in machinery we must first repair the little wheels out of gear, so in society we must first study the criminal, crank, insane, inebriate, or pauper who can seriously injure both individual and community. The community is most directly concerned, for it pays out millions to catch, try, and care for criminals, but almost nothing to study the causes that lead to crime. Thus in 1890 the expenses of all our penal institutions were more than twelve million dollars. This does not include the cost of criminal or police courts, of the property stolen, or the untold injury to society. A worthless criminal or crank kills a prominent citizen; the injury from such action is often beyond calculation.

CHILDREN SHOULD BE STUDIED FIRST.

However valuable the results of the investigation of man may be, they will always have an additional value when coming from the study of children. For whatever may be found of a detrimental character in both mind and body will always have a much better chance of correction in the child than in the adult.

We cannot expect to lessen crime and dangerous forms of abnormality unless we study the *causes*; this is the first requisite in all rational procedure; and these causes should be sought out

at their beginnings. Special emphasis is therefore laid on the investigation of criminal and abnormal children.

SUGGESTIONS AS TO FURTHER STUDIES.

It would be important to find what physical and mental characteristics are common to criminal children, and whether such characteristics are due more to the child's nature or more to his environment. Only thorough and patient study of large numbers of children can answer such questions; theory and speculation based on a few facts cannot, but they may accomplish good in calling attention to the subject. It is generally believed, but not proved, that crime is mostly due to surroundings; if this can be determined, then there is great hope of lessening it, for it is much easier to change the surroundings of a child than to change its nature.

INVESTIGATION OF SCHOOL CHILDREN.

Much study has been devoted to children in our public schools; mistakes have doubtless been made by those with more enthusiasm than training. But this is the case with all new lines of inquiry. Yet there are very practical matters we should know as to our schools. To establish the measure of the work according to the strength of the pupil is fundamental to health. For overtaxing the powers of the young can leave its mark for life.

What is the maximum work suitable to a child in the different periods of development in its school life? And can this maximum be injurious at times, as at puberty, when all the vital force may be required for growth? To answer such practical questions, we must know the physiology of normal growth; its rate of increase or decrease, and what influences cause such increase or decrease.¹

UNRULY AND REFORMATORY CHILDREN.

It would be desirable to find what physical and mental traits are common to unruly school children and children in reformatories. If there is nothing peculiar as compared with children

¹For further discussion see "Experimental Study of Children" (by writer), reprint from Report of Commissioner of Education for 1897-8, Washington, D. C.

in general, this is important to know. In like manner it would be interesting to know what characteristics, if any, are in common between the feeble-minded in our institutions and dull children in our schools. These and similar inquiries, when made with care and discretion, might enable us to foresee with some probability the special dangers that this and that child may be subject to, and thus to protect many children from temptations and conditions that otherwise might ruin them.

IMPORTANCE OF LARGE NUMBERS.

Where the number of persons studied is large, many subdivisions can be made, and in this way some of the most important, yet sometimes unexpected, results are reached. It would be well to know the difference, not only between children of the professional, mercantile, and laboring classes, but between those with American parents and foreign parents. Then, if the numbers were large enough to admit further subdivisions, we might find the difference between children whose father is American but mother foreign-born, and those whose mother is American and father foreign-born. In all such questions, if there is no striking difference, it is important to know it. Thus the influence of marriage between different races or nationalities upon the offspring might be determined more definitely.

If it should be found, for instance, from the comparison of large numbers, where all possibility of accident or coincidence is eliminated, that the difference between certain classes of children, such as the criminal, from children in general is quite marked, the question would arise whether such difference is due mainly to heredity or to unfavorable surroundings. In cases where the crime or defect is due to heredity, the treatment would be quite different from those in which environment is the cause.

QUESTION AS TO UTILITY.

But, it may be asked, what as to the utility of studying such questions? We think it is not only useful, but there is great need of such investigation. We should like to inquire, for instance, as to the utility of studying rocks and plants, arranging them,

making chemical analyses of them, etc., if it is not to give a deeper knowledge of them and thereby learn more about our planet. So the patient and extended study of man, especially children, is to gain more definite knowledge about him and a deeper insight into his nature. The time has certainly come when man, as he *is*, should be studied as much as nature.

RECENT CONCLUSIONS.

As an illustration of some results from recent studies of modern man, we give a number of conclusions of investigators from different parts of the world.

Some of the statements may appear to be of little utility, but, as the history of science has often shown, the real value of a single truth may not be known until other, cognate truths are discovered. These conclusions, of course, are to be taken in a *general* sense only; that is, they are true in *most* of the cases investigated:

Maximum growth in height and weight occurs in boys two years later than in girls (Bowditch).

First-born children excel later-born in stature and weight (Boas).

Healthy men ought to weigh an additional 5 pounds for every inch in height beyond 61 inches, at which height they ought to weigh 120 pounds (Lancaster).

Chest-girth increases constantly with height, and is generally half the length of the body (Landsberger).

Chest-girth and circumference of head increase in parallel lines (Daffner).

The relatively large size of head as compared with body in children may be due to the fact that from birth on the child needs its brain and senses as much as when it is grown (Weissenberg).

Boys grow more regularly than girls, but the growth of girls during school years is greater than that of boys (Schmidt).

In boys in school the muscles of the upper extremities increase with age as compared with those of the lower extremities, because of their sitting more than standing (Kotelmann).

Children born in summer are taller than those born in winter (Combe).

Boys of small frames often have large heads and are deficient in repose of character, and when the chest is contracted and mental action slow, this mental condition is due probably to lack of supply of purified blood (Lihartzik).

Delicate, slender people are much more subject to typhoid fever than to consumption (Hilderbrand).

Some defective children are over-normal, that is, they are taller and heavier than other children (Hasse).

Growth degenerates as we go lower in the social scale (British Association for Advancement of Science).

Dull children are lighter and precocious children heavier than the average child (Porter).

As circumference of head increases, mental ability increases; it being understood that race and sex are the same (MacDonald).

Urban life decreases stature from five years of age on (Peckham).

Truant boys are inferior in weight, height, and chest-girth to boys in general (Kline).

City children are more vivacious, but have less power of endurance, than country children (Lihartzik).

Among United States naval cadets there is a great preponderance of blonds (Beyer).

The insane show an excess of 5 per cent. of light eyes with dark hair and criminals of 10 per cent. of dark eyes with dark hair over the general population (Roberts).

In Germany 40 per cent. of the children of the well-to-do classes are blonds and less than 10 per cent. brunettes (Virchow).

The endurance (ergographic work) of boys is greater than that of girls at all ages (Christopher).

In reaction time the ear-lip coördination is the fastest (Angell and Moore).

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